

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
13 May 2004 (13.05.2004)

PCT

(10) International Publication Number
WO 2004/039707 A1

(51) International Patent Classification⁷: **B65G 47/32.**
B65B 35/32

(21) International Application Number:
PCT/IB2003/004772

(22) International Filing Date: 28 October 2003 (28.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
BO2002A 000679 30 October 2002 (30.10.2002) IT

(71) Applicant (for all designated States except US): I.M.A.
INDUSTRIA MACCHINE AUTOMATICHE S.p.A.
[IT/IT]; Via Emilia 428-442, I-40064 Ozzano Emilia (IT).

(72) Inventors; and

(75) Inventors/Applicants (for US only): MALDINA,

Lorenzo [IT/IT]; Via Martinelli 7, I-40133 Bologna (IT). TEDESCHI, Giancarlo [IT/IT]; Via Stanzano 105/A, I-40050 Gallo Bolognese di Castel S. Pietro (IT). ORILLO, Antonio [IT/IT]; Via della Bastia 4, I-40033 Casalecchio di Reno (IT).

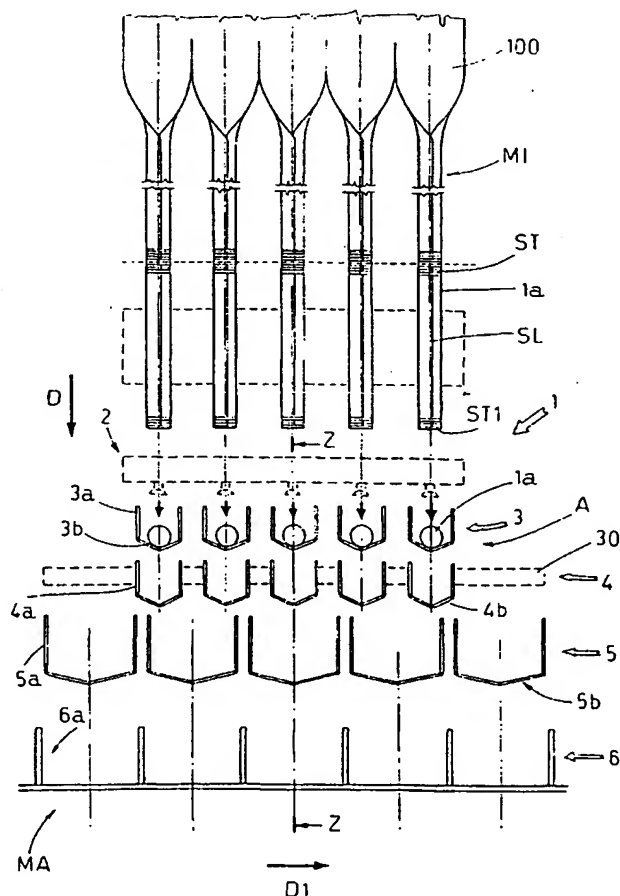
(74) Agent: DALL'OLIO, Giancarlo; Invention S.a.s., Via delle Armi, 1, I-40137 Bologna (IT).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: A UNIT FOR TRANSFERRING AND SPACING ARTICLES



(57) Abstract: A unit (1) for transferring articles (1) from a machine (MI) for producing these articles to a packaging machine (MA), includes a plurality of means (4a) for receiving said articles (1a), said receiving means (4a) being situated between an outlet station (3) of said producing machine (MI) and an inlet station (6) of said packaging machine (MA); the receiving means (4a) are arranged at a variable distance from one another and move alternatively between a first working configuration (A), in which the receiving means (4a) are moved closer to each other, in order to be situated in the region of, and in registry with, said outlet station (3) of the producing machine (MI), so as to receive said articles (1a), and a second working configuration (B), in which the receiving means (4a) are moved far from each other, in order to be situated in the region of, and in registry with, said inlet station (6) of the packaging machine (MA), so as to transfer the articles (1a) to the inlet station (6).

WO 2004/039707 A1

A UNIT FOR TRANSFERRING AND SPACING ARTICLES

FIELD OF THE INVENTION

5 The present invention relates to a unit for transferring articles from a producing machine to a packaging machine.

In particular, the present invention is used during the manufacturing of articles employed in food production field and during the packaging of the articles into
10 relative boxes and/or cases and/or cartons.

BACKGROUND OF THE INVENTION

The following description will refer explicitly to the production and packaging of the above articles, without
15 losing its general character.

There are manufacturing or in-bagging machines, which fabricate welded tubular wrappings or bags of the type known as flow-pack, containing granular substances therein.

20 More in detail, the in-bagging machines produce bags beginning from a continuous sheet, of e.g. heat-weldable paper, which is preliminarily cut, so as to define a plurality of strips, vertically parallel.

Afterwards, each of the strips is brought to a tubular
25 configuration by suitable folding means and then welded longitudinally along the edges.

In step relation with the longitudinal welding, the bottom of each vertical strip is also welded and afterwards, a measured quantity of the predetermined

transverse dimensions, the step between the above
hoppers, i.e. the distance between the hoppers, must be
changed, and consequently, the step or distance between
different box-compartments of the packaging machine
5 conveyor must be adjusted and changed.

As it is easily understood, such changes result in
difficult and complicated adjustment work, which causes
long downtimes.

10 SUMMARY OF THE INVENTION

The object of the present invention is to overcome the
drawbacks and solve the problems of the above described
prior art.

According to the present invention, a unit is
15 manufactured for transferring articles from a producing
machine to a packaging machine, and is characterized in
that it includes a plurality of means for receiving said
articles, said receiving means being situated between an
outlet station of said producing machine and an inlet
20 station of said packaging machine; said receiving means
being arranged at a variable distance from one another
and moving alternatively between a first working
configuration, in which the receiving means are moved
closer to each other, in order to be situated in the
25 region of, and in registry with, said outlet station of
the producing machine, so as to receive said articles,
and a second working configuration, in which the
receiving means are moved far from each other, in order
to be situated in the region of, and in registry with,
30 said inlet station of the packaging machine, so as to
transfer the articles to the inlet station.

- 5 -

vertically parallel to a vertical direction D of the Figure 1.

The pick up means drop the groups of tubular bags in horizontal configuration, that is with the longitudinal
5 welding lines SL arranged horizontally and crosswise to the direction D, into a plurality of discharge buckets 3a of an outlet station s of the bag producing machine MI.

The discharge buckets 3a are preferably defined by
10 hoppers 3a. The bottom ends 3b of the hoppers can be opened and are arranged at a fixed distance one from the other, as a function of the size of the tubular bags 1a, in particular of the transverse dimension of the bags 1a.

The unit 1, proposed by the present invention, includes a conveying line 4, situated downstream of the outlet
15 station 3 of the bag making machine MI and equipped with a plurality of mobile buckets 4a. The distances between the axes of the mobile buckets, or step, can be varied.

A terminal line 5, situated in cascade with respect to the direction D, includes a plurality of terminal buckets
20 5a, arranged at fixed distances from one another and facing, each one, a relative box-compartment 6a of the inlet conveyor 6 of the packaging machine MA.

According to Figures from 1 to 5, the mobile buckets 4a are preferably defined by hoppers 4a; the bottom ends 4b
25 of the mobile buckets can be opened. In operation, the distance between the axes of the mobile buckets 4a is changed from a receiving configuration A, in which the buckets 4a are situated each one below, and in registry with a relevant discharge hopper 3a, in order to receive
30 the tubular bags 1a falling from the bottoms 3b (Figure 2) being opened, to a release configuration B, in which each bucket 4a is situated above, and in registry with a

- 7 -

the terminal line 5 can mounted on a support 50 (shown with broken line in Figure 2), stationary with respect to the outlet station 3 of the bag making machine MI.

Otherwise, if the conveyor 6, equipped with box
5 compartments 6a, moves continuously, the correct drop of the tubular bags 1a into the box compartments 6a is ensured by mounting the terminal hoppers 5a on a movable support 50, e.g. of the known follow-type, sliding with respect to the outlet station 3, in step relation with
10 and at the same speed as the conveyor 6.

The operation of the unit 1 will be described in the following with reference to an operation step, in which the pickup means 2 have already dropped single bags 1a, in horizontal configuration, into each discharge hopper
15 3a.

In time relation with the drop of one tubular bag 1a into each discharge hopper 3a, the mobile hoppers 4a are moved to the receiving configuration A by compacting them slidingly along the guides 30, (Figure 1). In this
20 configuration, the bottoms 3b of the hoppers 3a open, so as to make the bags 1a fall directly into the hoppers 4a (Figure 2).

At this point, the hoppers 4a are moved in relative expansion along the guide 30 up to the release
25 configuration B (Figure 3), so as to be arranged exactly above the terminal hoppers 5a of the terminal line 5, and in such a way that, when the respective bottom ends 4b open, the bags 1a situated inside the hoppers 4a are free to fall into the respective terminal hoppers 5a (Figure
30 4).

As it is better seen in Figure 3, as soon as the tubular bags 1a are released from the outlet station 3 to the

3a, to the release configuration B, in which they are situated above the terminal hoppers 5a.

Therefore, the proposed unit 1 allows quick and simple change-over operation, when the size of the articles
5 being packaged is changed, thus reducing substantially the downtimes and therefore increasing the overall production rate.

In particular, according to the preferred embodiment, there are provided five mobile hoppers 4a, (that is an
10 odd number of hoppers) and therefore, the central hopper 4a remains stationary, while the lateral hoppers are moved, so as to be set in registry either with the discharge hoppers 3a or with the terminal hoppers 5a, whichever is the case in accordance with the operation
15 step.

The terminal hoppers 5a have suitable dimensions, which allow to release into the box-compartments 6a, underlying the terminal hoppers 5a, a number of tubular bags 1a, which varies within a wide range.

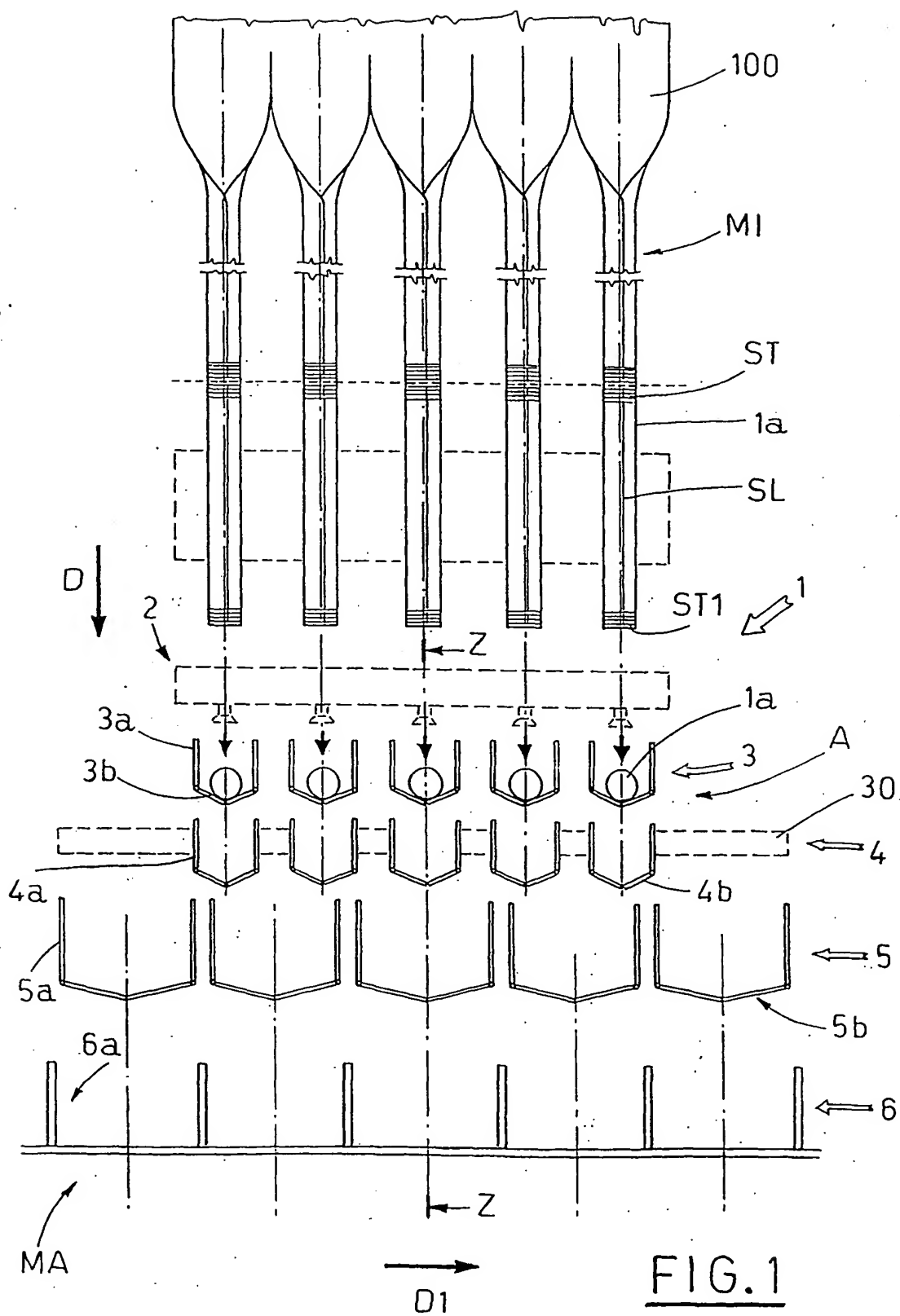
20 It is also to be pointed out that in this case, each group of hoppers 3a, 4a and 5a (discharge, mobile for transferring and terminal) when considered in vertical, feed a selected series of boxes 6a. Therefore, it is particularly easy to detect and correct possible wrong
25 operation, for instance when an incorrect number of bags is contained in a box-compartment or the total weight of the bags contained in a box-compartment does not match the expected value. The verify can be easily performed by checking the cases packaged in the packaging machine MA
30 and the correction can be effected directly upstream of the machine MA, acting on the vertical group of hoppers

CLAIMS

1. A unit (1) for transferring articles (1) from a machine (MI) for producing these articles to a packaging machine (MA), the unit being characterized in that it includes a plurality of means (4a) for receiving said articles (1a), said receiving means (4a) being situated between an outlet station (3) of said producing machine (MI) and an inlet station (6) of said packaging machine (MA); said receiving means (4a) being arranged at a variable distance from one another and moving alternatively between a first working configuration (A), in which the receiving means (4a) are moved closer to each other, in order to be situated in the region of, and in registry with, said outlet station (3) of the producing machine (MI), so as to receive said articles (1a), and a second working configuration (B), in which the receiving means (4a) are moved far from each other, in order to be situated in the region of, and in registry with, said inlet station (6) of the packaging machine (MA), so as to transfer the articles (1a) to the inlet station (6).

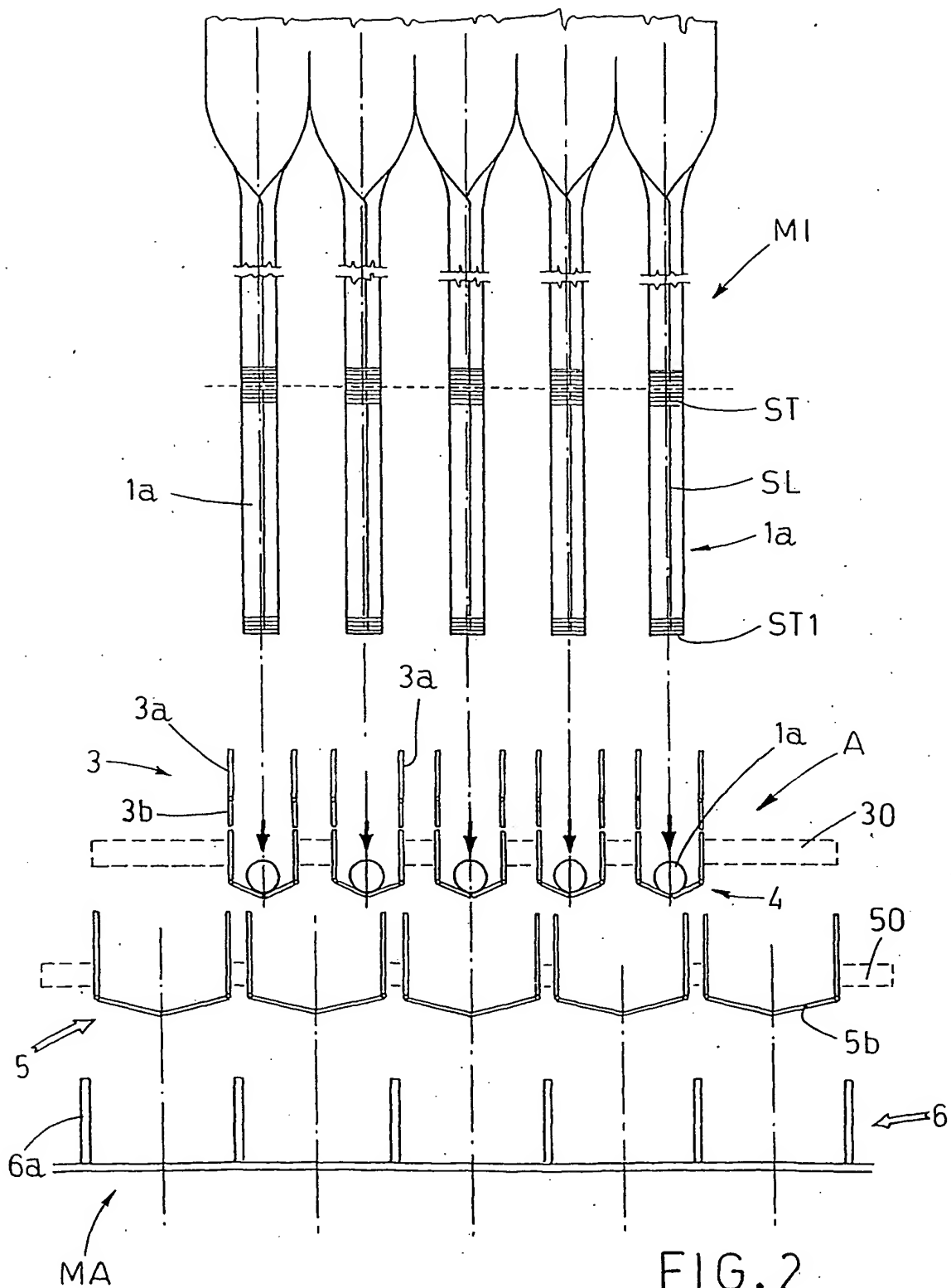
2. A unit according to claim 1, characterized in that said receiving means (4a) are mounted moving on guide means (30), in order to alternatively compress/expand with respect to one another, under the action of motor means.

3. A unit according to claim 1 or 2, characterized in that said receiving means (4a) include a plurality of hoppers (4a) equipped with bottoms (4b), which can be



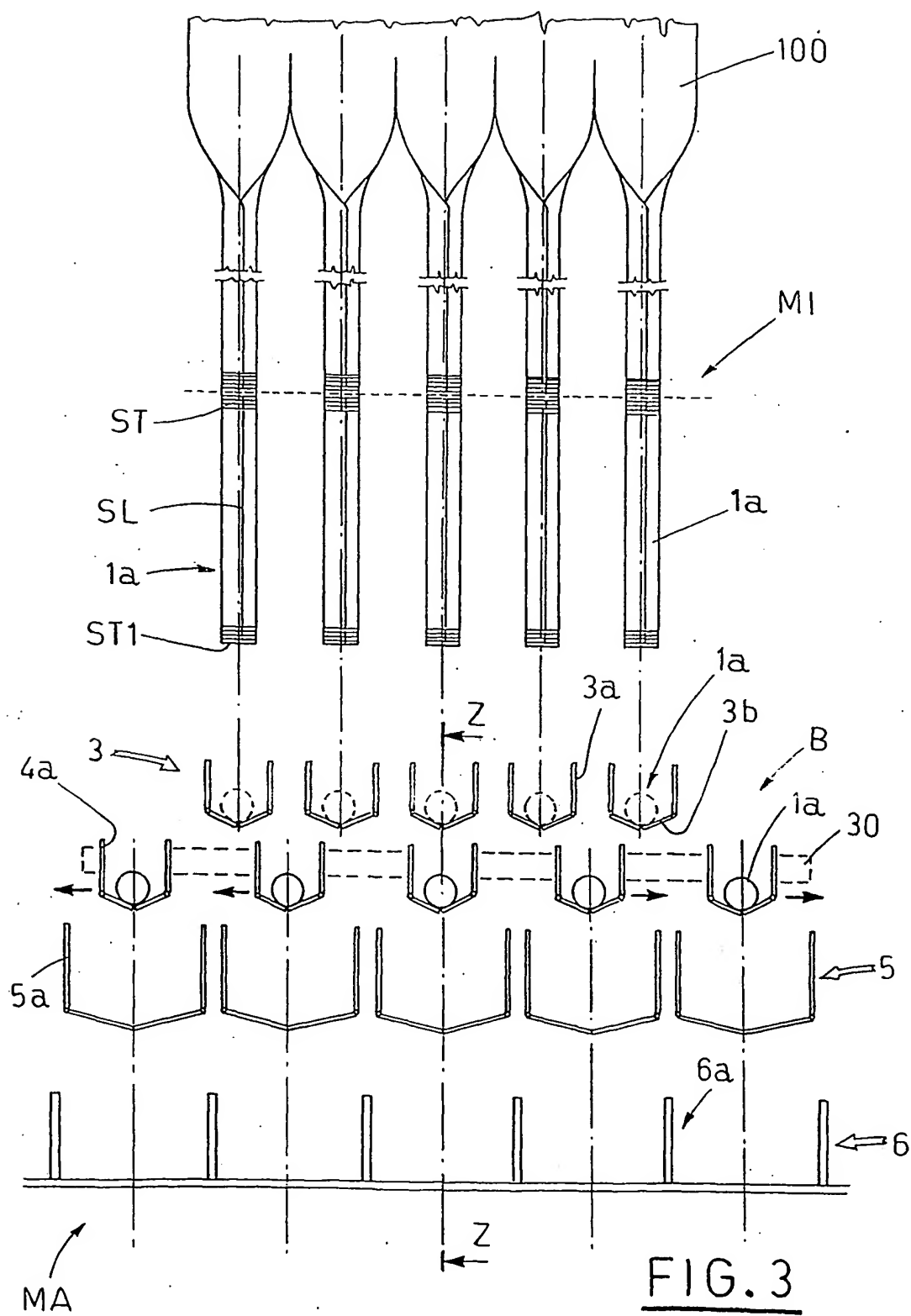
2 / 5

10/533273



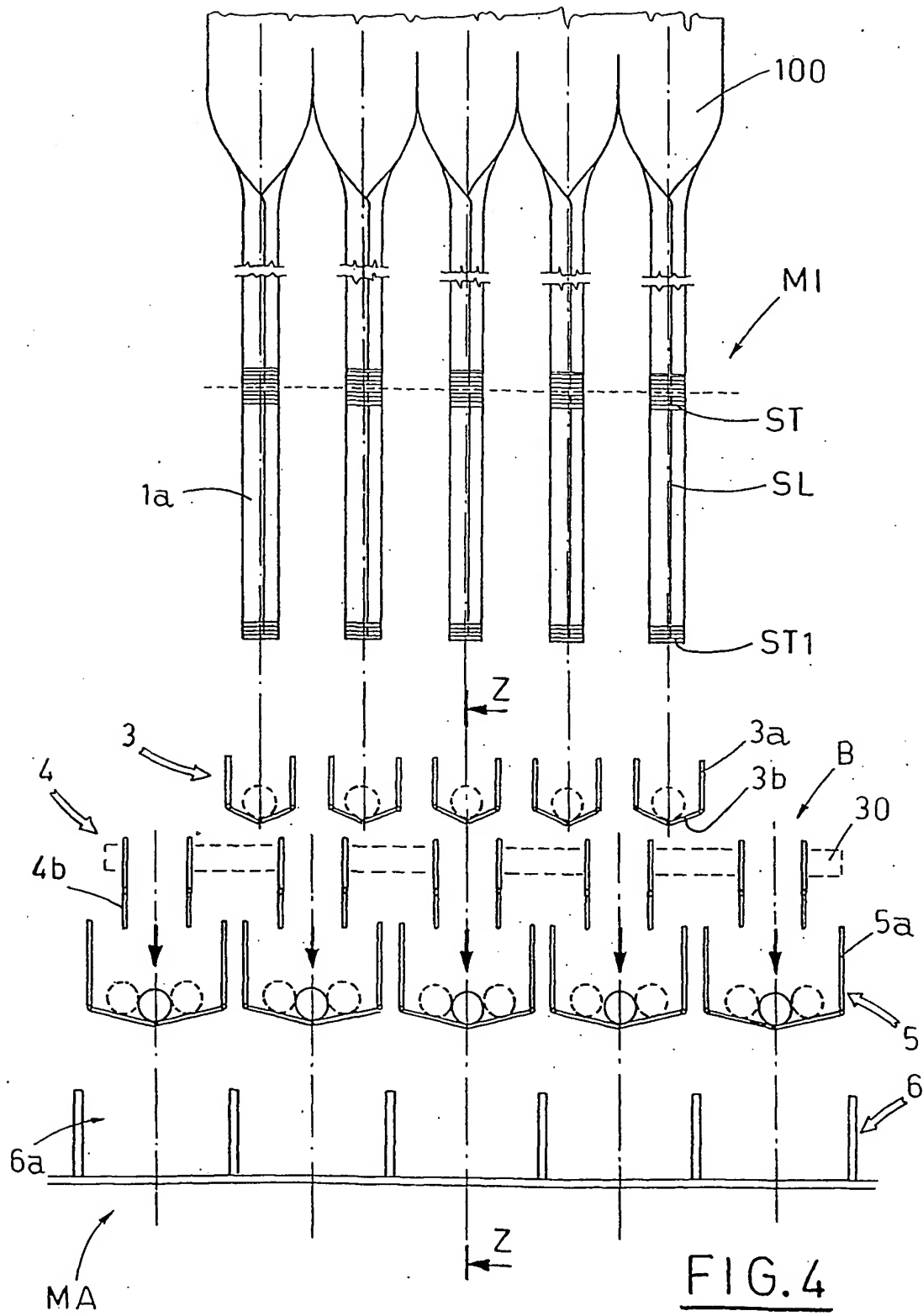
3/5

10/533273



4/5

10/533273



5/5

10/533273

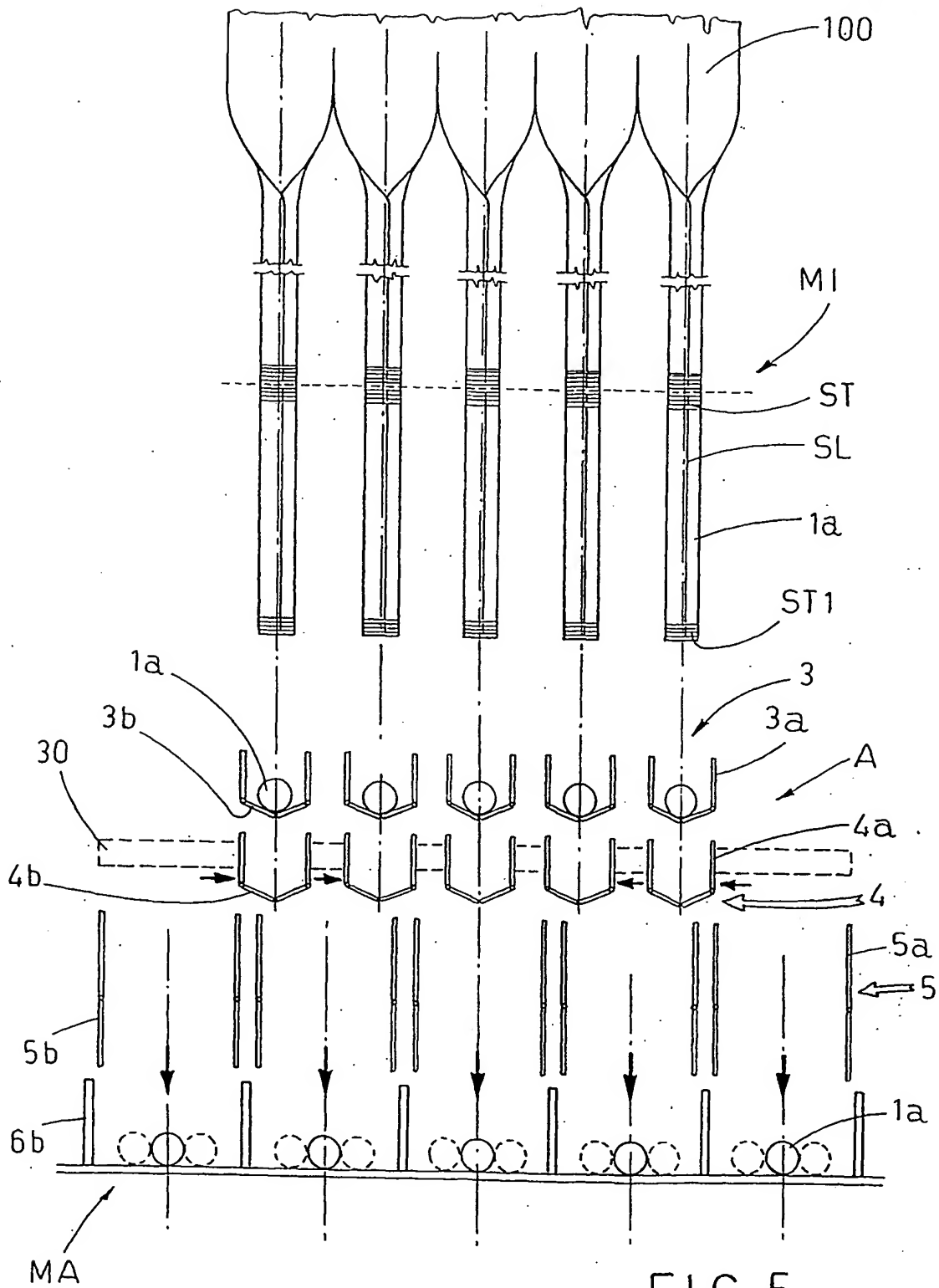


FIG. 5